IMPORTANCE OF SOCIAL SKILLS IN KOREA'S LABOR MARKET

By

CHOI, Jung Hee

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

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Committee in
charge:

Professor Ju-Ho LEE, Supervisor

Professor Jaeun SHIN

Professor Soonhee KIM

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ABSTRACT

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Jung Hee Choi

According to the OECD's project on Definition and Selection of Key Competencies, key competencies required for successfully dealing with the complex demands of society in the 21st Century include "social skills", or the ability to interact with other people. Although evidence from numerous researches emphasizes the importance of social skills, Korea's education has continuously maintained its focus on rote-learning and cognitive skills. The aim of this research is to test whether social skills indeed have relevance in Korea's labor market. Using data from Korea Education and Employment Panel, this study shows that social skills have a positive impact on individual earnings. Such a relationship between social skills and earnings holds true even after controlling for cognitive skills and other types of non-cognitive skills, as well as occupation and industry fixed effects.

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I would first like to express my sincere gratitude to my main thesis advisor, Professor Ju-Ho Lee, whose guidance has played an immense role in not only the completion of this thesis, but also my overall academic development throughout my time as a master's student. I would also like to thank Professor Jaeun Shin for providing invaluable advice and support, without which the completion of this thesis would not have been possible. I also truly appreciate the help provided by Professor Junesoo Lee, whose comments and advice helped me gain a better understanding of the fundamental elements of academic research.

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1. Introduction

According to the OECD's project on Definition and Selection of Key Competencies (DeSeCo), key competencies required for successfully dealing with the complex demands of society in the 21st Century include "social skills". Also referred to as human-interaction skills or people skills, social skills are important not only for social cohesion amid greater fragmentation and diversity in society, but are crucial for determining one's success and survival due to growing emphasis put on emotional intelligences by firms and economies (OECD, 2005). On a survey of members of private sector companies and educational institutions, almost one-half (48%) of the respondents answered that the skills that will be in highest demand in the next decade are social skills (termed "life skills" in the survey), defined as negotiating, networking, and working with cultural diversity (Andreasson, 2009). The World Economic Forum's *The Future of Jobs* report predicts that social skills will be in higher demand than narrowly defined technical skills like equipment control and operation or programming (World Economic Forum, 2016).

Social skills are also stated to be important in Korea's labor market. Through interviews of human resource managers of the top 50 firms in Korea, Lee (2014) shows that more so than technical skills, firms increasingly put emphasis on social skills when hiring new workers. Reasons behind this include the fact that tasks have become less routine and require greater team work, as well as the need for better communication and understanding amongst workers of different generations. The greater emphasis put on personal interviews and team projects in the recruitment process also signal the importance of social skills in the work place (Lee, 2011).

Figure 1 displays the change in the input of social skills relative to other skills in Korea's

labor market by using the Korea Wage and Working Hours Data (KWWHD, Ministry of Employment and Labor) in conjunction with Korea's WORKNET information (Korea Employment Information Service). The KWWHD provides annual information on the average monthly income and number of people employed by occupation type. WORKNET is an information service system that provides information on the different requirement levels of 45 categories of skills on a 0~100 scale[1] for different occupations. Using the method of Deming (2015), an occupation's social skill[2] intensity is measured as the average of four WORKNET skill measures: 1) Coordination; 2) Negotiation; 3) Persuasion; 4) Social Perceptiveness.[3] Each level of WORKNET skill type for each occupation was multiplied to the annual employment proportion of the respective occupation, and the change in the annual proportion of social skills and math skills among the total sum of all skills is shown in Figure 1. It is evident that the relative use of social skills has risen in Korea since the early 1990's until 2014.

[1] Although both the KWWHD and WORKNET use Korea Standard Classification of Occupation (KSCO) for occupational classification, KWWHD uses the 2- or 3-digit classification while WORKNET provides information based on the more detailed 4-digit classification. Therefore, each WORKNET skill information at the 4-digit levels were re-grouped into the KWWHD 2-, 3-digit occupation classification, and the average skill level among 4-digit occupations was used to represent the skills level of each KWWHD occupation classification. Also, updates and changes were periodically made to the KSCO: the 1993-1999 data uses KSCO 4th edition; 2000-2008 data uses the KSCO 5th edition; 2009-2014 data uses KSCO 6th edition. Thus, depending on the KSCO edition, the WORKNET 4-digit occupations are grouped into different 2- or 3-digit classifications for the KWWHD. Therefore, there are limitations in viewing the whole period (1993-2014) as a single period, and it is more accurate to view them separately by the years represented by different KSCO editions.

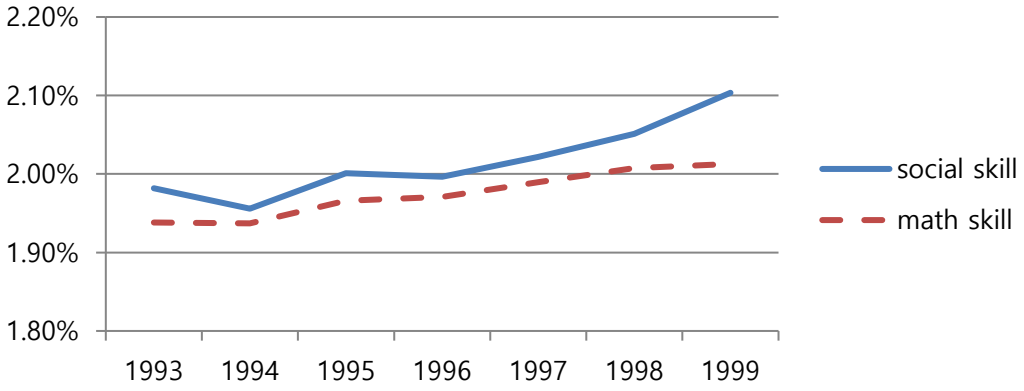
[2] 'social skill' is distinguished from 'service skill'; 'social skill' focuses on skills used at the production stage while 'service skill' centers on skills used in customer service (Deming, 2015)

[3] WORKNET defines the skills that compose 'social skills' as follows:
1) Coordination: Adjusting to actions in relation to others' actions
2) Negotiation: Bringing others together and trying to reconcile differences
3) Persuasion: Persuading others to change their minds or behavior
4) Social Perceptiveness: Being aware of others' reactions and understanding why they react as they do

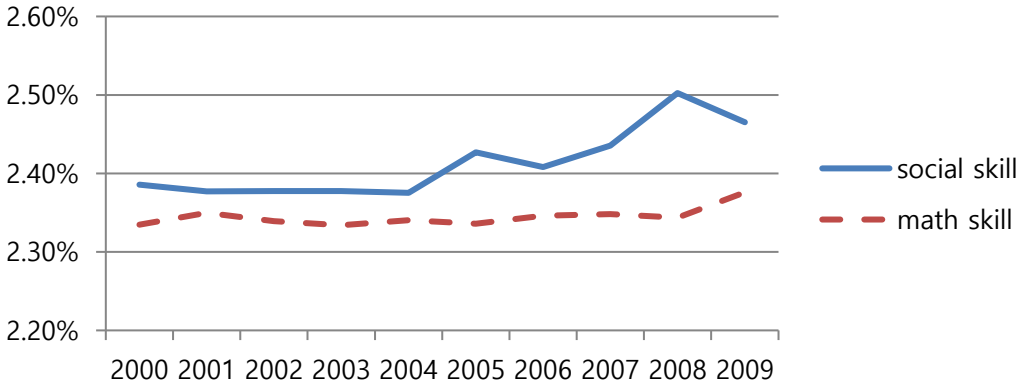
Using the KWWHD and WORKNET data, Figure 2 displays the average required levels of social skill for each centile of the wage distribution for different periods. It is evident that between the early 1990's and 2014, jobs that receive higher wages tend to require relatively higher levels of social skills.

Figure 1. Proportion of 'Social Skill' Among Entire Input of All Skill Types

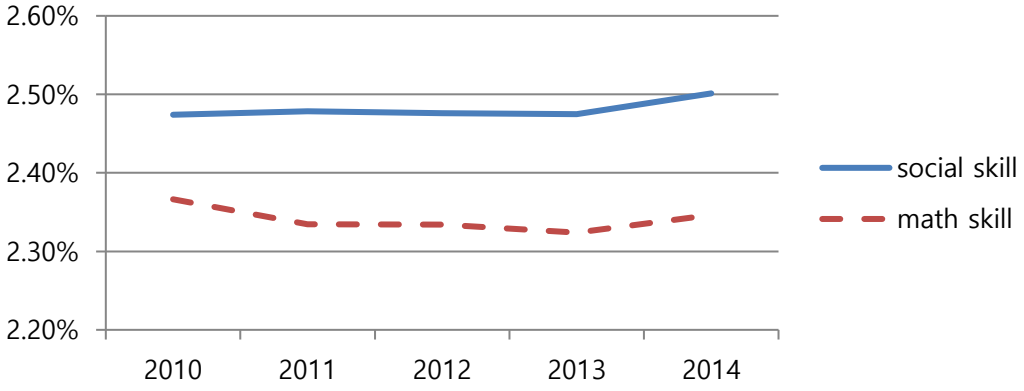
(a) 1993-1999



(b) 2000-2008



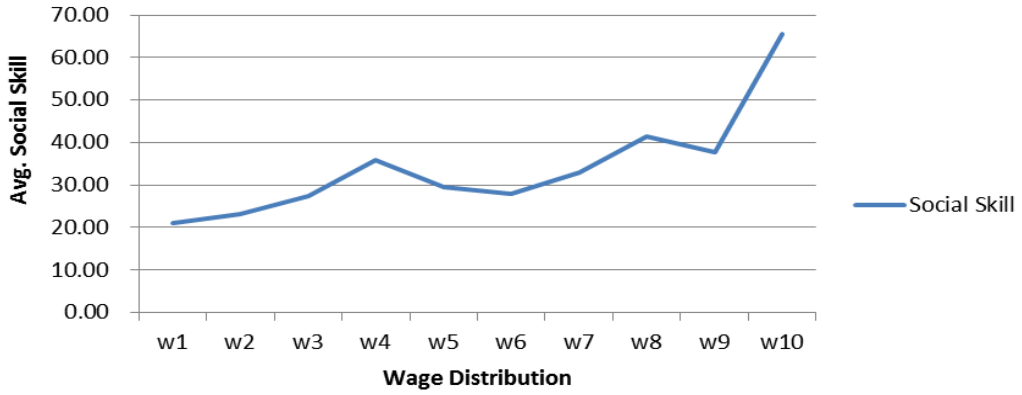
(c) 2009-2014



Source: Korea Wage and Work Hour Data, WORKNET data

Figure 2. Average Social Skill Requirement by Wage Distribution

(a) 1993-1999



(b) 2000-2008

(c) 2009-2014

Source: Korea Wage and Work Hour Data, WORKNET data

While the importance of social skills is emphasized both domestically and abroad, there is great concern regarding the lack of attention put on its development in schools in Korea (Lee, Ryoo, & Lee, 2014b). Compared to their international counterparts, Korean students spend much more time on individual study at the expense of time spent on sports and socialization activities (Kang & Lee, 2015). The teaching and assessment methods of Korean schools are centered on rote-learning and multiple choice questions, which likely deter the development of social skills (Lee et al., 2014b). In addition, while employers emphasize the importance of human-interaction skills, a recent survey shows that college students tend to focus on other aspects such as specific job-related skills and foreign language development (Chosun Daily, 2015.11.26).

In recent years, with youth unemployment at its highest in many OECD countries, it has become evident that educational attainment itself is no longer sufficient for obtaining desirable labor market outcomes (OECD, 2015). In particular, in Korea, where the percentage of people with tertiary education for the 25-34 age group is the highest in the world at 68% (OECD, 2015), evidence of inefficient human capital accumulation has been found for higher education amid growing investment at both the public and individual levels (Lee, Jeong, & Hong, 2014a). Against this social backdrop it is necessary to go beyond educational attainment and focus on specific skills and their association with socioeconomic outcomes, and numerous researches have emphasized the importance of social skills. By using data on individual skills and income, the aim of this study is to empirically test whether social skills are indeed valued in Korea's labor market.

The remaining parts of this paper are organized as follows. Section 2 presents the literature review pertaining to non-cognitive skills, social skills and labor market outcomes.

Section 3 introduces the data and research method used for analysis and Section 4 presents the results of the data analysis. Section 5 discusses educational implications and Section 6 concludes.

2. Literature Review

The impact of an individual's skills on economic outcomes has been studied in various social science literatures. The bulk of the research has focused on measurable cognitive skills, such as IQ, numeracy and literacy (Cawley, Heckman, & Vytlacil, 2001; Hanushek, Schwerdt, Wiederhold, & Woessmann, 2015; OECD, 2013). Although cognitive skills are important, they simply measure a single dimension of human skills that are valued in the labor market (Heckman, 1995). An increasing number of literature focus on the role of non-cognitive skills, which are behavioral and personality attributes and skills that cannot be measured through traditional evaluation methods as is done for cognitive abilities. Heckman and Rubinstein (2001) attribute lower non-cognitive ability to explain why General Educational Development (GED)[4] recipients in the United States earn lower average earnings than traditional high school graduates. Non-cognitive skills have also been shown to have a positive effect on the probability of entering a higher social class in terms of occupation (Jackson, 2006), and lead to higher wages through increased productivity in the work place (Heckman, Stixrud, & Urzua, 2006).

A growing number of studies have been conducted on non-cognitive skills and labor market outcomes in Korea. According to Lee (2013), the level of personal importance put on

[4] GED recipients are high school dropouts that pass a test which certifies them as equivalent to high school graduates in terms of cognitive proficiency

non-cognitive skills, such as sincerity, altruism, flexibility, sense of challenge, and independence, have positive effects on the probability of entering occupations with greater social prestige. Also, Lee and Lee (2011) show that individual wage and firm size, which represents overall quality of occupation in Korea, are positively affected by non-cognitive skills. Additionally, the self-assessed level of creativity is shown to have a non-significant impact on income during the early stages of one's career, but have a positive impact as time passes on (Kim, 2010).

Among the various types of non-cognitive skills, recent studies have highlighted the importance of social skills in the labor market. According to the OECD (2005), social skills involve the ability to relate to others, to cooperate and work in teams, and manage and resolve conflict. In particular, the development of modern technology is considered a major factor behind the rise in importance of social skills (Deming, 2015; Frey & Osborne, 2013). Through an analysis of the effect of computerization on different occupations, Frey and Osborne (2013) show that as technology continues to improve amid routine-biased technological change (RBTC), where routine cognitive tasks are replaced by computer technology (Acemoglu & Autor, 2011; Autor, Levy, & Murnane, 2003; Choi & Cho, 2013; Kim, 2014; Michaels & Natraj, 2014), low-skill workers are likely to reallocate to tasks that require social intelligence. This is due to the fact that computers cannot yet sufficiently substitute tasks that involve tacit knowledge held by humans (Autor, 2014). Deming (2015) shows that social skill-intensive jobs have experienced positive employment growth throughout the wage distribution in the U.S. and that there is complementarity between social skills and cognitive skills, which is consistent with the findings of Weinberger (2014). Additionally, Humburg and Van Der Velden (2015) show that for college graduates,

interpersonal skills is one of the most important factors behind hiring decisions made by employers.

While an increasing number of studies analyze the role of various non-cognitive skills in Korea's labor market, to my knowledge, none have specifically focused on social skills. With growing evidence on the importance of social skills, it is necessary to explore their empirical relevance on labor market outcomes in Korea.

3. Data and Methods

3.1 Data

This study uses data from the Korean Education and Employment Panel (KEEP) study developed and managed by the Korea Research Institute for Vocational Education and Training (KRIVET). Launched in 2004, the dataset follows a cohort of students who were in the third grade of middle school in that year, a cohort of students who were in the third year of general high school, and a cohort of students who were in the third grade of vocational high school. For this study, I mainly use the 9th wave of the panel survey (the latest wave available for public-use) for the general and vocational high school cohorts. Since all of the respondents were part of the same school grade, contamination of ability measure estimates due to cohort effects can be avoided (Eren & Ozbeklik, 2013). As the sample was surveyed in 2012, the age of the respondents will range between 24 and 26 depending on the year and month of birth.[5] Considering the age range of the sample and the average years of work

[5] Until 2010, according to Korea's education law, students born between January and March entered school at the same time as students born a year earlier (between April and December). Thus, the respondents of the working sample were born either in 1986 or 1987.

experience of approximately 1.3 years, this research is only able to analyze the skills and earnings of entry-age workers while excluding those who are in their prime-age and exit-age years. The focus on early-career skills and earnings likely underestimate the full lifetime returns to skills (Hanushek et al., 2015; Haider & Solon, 2006). To obtain a sample of homogeneous workers with strong labor force commitment, for the working sample I only include those who are employed as full-time wage earners, and thus exclude those who are enrolled in school as well as those who work for a family business without pay or run their own business. Full-time refers to working for the whole business day, in contrast to those who work on a part-time basis.

The main outcome variable is the natural log of monthly income, excluding bonuses and extra compensations for overtime work. To construct a pre-labor market measure of social skills, I use the following four variables obtained through the 1st wave of the KEEP data, at which point in time the respondents were in their senior year of high school:

1) Self-assessed level of interpersonal relations with friends

2) Homeroom teacher-assessed level of interpersonal relations with classmates

3) Parent-assessed level of interpersonal relations with classmates

4) Participation in high school club activities (yes/no)

The first three variables used for measuring social skills measure how strongly one agrees with the idea that the student gets along well with others,[6] which is a critical element of

[6] To each question, the respondent answered using a five-point Likert scale: 1) Strongly disagree; 2) Disagree; 3) Neither agree nor disagree; 4) Agree; 5) Strongly agree.

social skills. Participation in club activities in youth has been shown to increase experiences in student-to-student interaction and contribute to the development of interpersonal skills **(**Pascarella, E. & Terezini, P., 1991**).** Following the method of Deming (2015), I first standardize each variable to have a mean of zero and a standard deviation of one. Then I take the mean value of the four variables and re-standardize it with the same conditions. As the level of social skill is derived through data obtained before anyone in the sample entered the labor market, the problem of reverse causality is avoided. In other words, I avoid dealing with the possibility that income works to develop social skills.

Unlike cognitive skills, for which individual levels can be directly measured through various testing methods, there is no clearly defined way of directly measuring non-cognitive skills due to its nature. Thus, a possible concern regarding the measure of social skill used in this paper is that rather than representing a distinct category of skill, it may simply be a proxy for other non-cognitive skills in general. To deal with this issue and better isolate the effects of social skills, I include other forms of non-cognitive skills in the empirical models, namely self-esteem and self-knowledge. Self-esteem refers to the degree with which one has belief in self-worth and is used frequently in literatures that estimate the effect of non-cognitive skills (Deming, 2015; Eren & Ozbeklik, 2013; Heckman et al., 2006). Self-knowledge is the degree to which one knows about him or herself. Psychology literatures view it to be related to self-awareness, and ultimately self-efficacy (Bandura, 1997), which has been shown to significantly affect labor market results (Dunifon & Duncan, 1998; Groves, 2005). In the present paper, self-esteem is measured through to what degree the respondent agrees with the phrase “I feel good about myself.” Self-knowledge is measured through the following two

variables: 1) I know what is important in my life; 2) I know what I like to do.[7] As is the case of the measurement of social skills, the self-esteem variable is standardized to have a mean of zero and standard deviation of one, and the variables that measure self-knowledge are each initially standardized to have a mean of zero and standard deviation of one, and the mean of the two is re-standardized.

For cognitive skills, an individual's percentage rank on the math and literacy parts of the CSAT taken in 2005 is used.[8] The CSAT math and literacy scores serve two functions that affect individual income. First, it can serve as a direct indicator of one's cognitive abilities (Choi & Min, 2013). Second, as a higher CSAT score generally increases the probability of entering higher ranked schools, it can function as a proxy for the ranking of the college that an individual attended (Hwang & Baek, 2008). Under a system of strict vertical hierarchy in rankings among Korean colleges (Lee et al., 2014a), attending higher ranked colleges can increase the chances of getting a higher wage. The percentage rank of numeracy and literacy were standardized to have means of zero and standard deviations of one, allowing both variables representing cognitive skills to have the same distribution as those representing non-cognitive skills. The final sample size is 590, and descriptive statistics are shown in Table 1.

[7] The variable that measures self-esteem and the variables that measure self-knowledge were answered on a five-point Likert scale: 1) Strongly disagree; 2) Disagree; 3) Neither agree nor disagree; 4) Agree; 5) Strongly agree.

[8] Under Korea's college admission system, the CSAT is conducted once a year and individuals may re-take the exam in the following years if one wishes. For this research, only the scores of the 2005 exam were used to obtain a more accurate percentage rank.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Monthly Income	590	172.9	61.44	76	1000
Self-assessed social skill	590	3.858	0.687	1	5
Parent-assessed social skill	590	4.054	0.654	2	5
Teacher-assessed social skill	590	3.725	0.664	1	5
High school club	590	1.546	0.498	0	1
Numeracy	590	38.73	28.93	0	100
Literacy	590	42.23	28.36	0	100
Self-Esteem	590	3.454	0.778	1	5
Self-Knowledge of Values	590	3.354	0.906	1	5
Self-Knowledge of Preference	590	3.683	0.834	1	5
Work Experience	590	1.302	1.370	0	9
Gender	590	0.392	0.489	0	1
Firm Size	586	369.7	397.9	2.500	1000
Education Level	590	2.888	0.331	1	3

Notes: Sample: Those who are employed full-time as wage earners (in contrast to individuals working without pay for family business or running own business). Full-time workers are defined as those who work for the whole business day. *Monthly Income*: gross monthly income, excluding bonuses, expressed in terms of ten-thousand Korean won. *High school Club*: indicator dummy for participation in high school clubs. *Numeracy*: percentage ranking of respondent's math score on the 2005 College Scholastic Aptitude Test (CSAT). *Literacy*: perecentage ranking of respondent's literacy score on the 2005 CSAT exam. *Self-Knowledge of Values*: degree to which the respondent knows what are important in one's life. *Self-knowledge of Preference*: degree to which the respondent knows what he or she wants to do. *Work Experience*: total years of work experience in current job. *Firm Size:* number of employees working in respondent's work place. *Education Level*: variable indicating respondent's highest education level (1=below high school graduate; 2=high school graduate; 3=college graduate and above)

Source: KEEP.

3.2 Empirical Model

Numerous researches have used the Mincer equation (Mincer, 1974) for analyses on individual earnings, education and skills. The underlying premise of the Mincer equation is that the amount of schooling serves as a reasonable measure of human capital due to the fact that the goal of schooling is the development of general skills of individuals (Mincer, 1974). The standard Mincer equation is expressed as follows:

$$\log(y_i) = \beta_0 + \beta_1 YrsSchool_i + \beta_2 WorkExp_i + \beta_3 {WorkExp_i}^2 + \varepsilon_i \quad (1)$$

where for individual i, y_i is earnings; $YrsSchool$ is years of schooling; and $WorkExp$ is years of work experience. A quadratic function for work experience is included in consideration of the tendency of wages to rise in a concave manner with increase in experience. ε is the error term, or the unobserved factors that affect individual income. Here, the main variable of interest is β_1, which represents a percentage increase in earnings associated with an additional year of schooling, referred to as the 'return to education'. The Mincer equation has been utilized by numerous researchers since its introduction, but one of its limitations lies in its implication of schooling as the sole systematic source of skill differences (Hanushek et al., 2015). In other words, it is unable to take into account skill heterogeneity that is bound to exist among people with identical years of education.

For analysis on the association between skills and wages of the adult population, Hanushek et al. (2015) utilizes the basic Mincer equation, but substitutes years of schooling with directly measured levels of cognitive skills. The present research follows this method of Hanushek et. al (2015) by including a measure of social skill in place of years of schooling to

develop the following empirical model, which estimates the 'returns to social skills':

$$\log(y_i) = \beta_0 + \beta_1 SS_i + \beta_2 Num_i + \beta_3 Lit_i + \beta_4 SelfEsteem_i + \beta_5 SelfKnow_i + \beta_6 E_i + \beta_7 E_i^2 + \beta_8 G_i + \varepsilon_i \quad (2)$$

where for individual i, y is monthly income (excluding bonuses); SS is social skill; Num and Lit are numeracy and literacy (cognitive skills), respectively; $SelfEsteem$ and $SelfKnow$ are self-esteem and self-knowledge (non-cognitive skills), respectively; E is years of work experience; G is an indicator dummy for gender (male=1, female=0); and ε is the error term. All variables that represent a skill are standardized to have a mean of zero and standard deviation of one. β_1, the main coefficient of interest, represents the returns to social skills. As the dependent variable is the log of monthly income, β_1 shows the percentage increase in income that is associated with a single standard deviation increase in social skills. In the same manner, β_2 and β_3 can be interpreted as the returns to cognitive skills, and β_4 and β_5 are the returns to non-cognitive skills other than social skills.

In addition, through equation (3) I will estimate the returns to social skills conditioned on educational attainment in order to show the empirical relevance of education.

$$\log(y_i) = \beta_0 + \beta_1 SS_i + \beta_2 Num_i + \beta_3 Lit_i + \beta_4 SelfEsteem_i + \beta_5 SelfKnow_i + \beta_6 Edu_i + \beta_7 E_i + \beta_8 E_i^2 + \beta_9 G_i + \varepsilon_i \quad (3)$$

where Edu_i is the educational attainment level (below high school graduate=1; high school graduate=2; college graduate and above=3) of individual i. Technically, conditioning on

educational attainment may imply that the model estimates the impact of social skills on earnings, net of the impact of schooling. However, including variables on educational attainment in models that predict the effect of skills can cause problems of endogeneity; education can be a cause of skill development and at the same time those who are more skilled have a greater chance of obtaining more education (Hanushek et al., 2015; Heckman et al., 2006).

Equation (4) includes controls for various job-related variables.

$$\log(y_i) = \beta_0 + \beta_1 SS_i + \beta_2 Num_i + \beta_3 Lit_i + \beta_6 SelfEsteem_i + \beta_7 SelfKnow_i + \gamma X + \beta_8 E_i + \beta_9 E_i^2 + \beta_{10} G_i + \varepsilon_i \quad (4)$$

where X is a vector of control variables pertaining to the respondent's work, including firm size, occupation type, industry, and geographical region. Firm size is the number of employs employed in the respondent's work place, and is represented by a categorical variable which indicates the range of the number of workers in the respondent's firm. For the present research, I replace each category of the firm size variable with the median of the range of workers represented by each category and treat it as a continuous variable. In Korea, evidence of job polarization have been found since the 1990s, and firm size has been used as an indicator to differentiate between jobs of higher and lower quality in terms of pay, stability and welfare (Lee & Lee, 2011; Nam, 2011; Hwang & Baek, 2008). I also include variables control for occupation and industry fixed effects, which allows for observing to what degree the returns to social skills is affected by selection into specific occupations and industries. Accounting for occupation and industry fixed effects means that within-occupation and with-

industry estimates for the returns to social skills can be obtained. The variable for occupation is a categorical variable that classifies the respondents' occupation into 14 different occupation types based on the Korea Employment Classification of Occupations (KECO), and the variable for industry classifies the respondents' industry into 17 different industry types based on the Korea Standard Industrial Classification (KSIC).

4. Results

The results of equation (2) are shown in Table 2. Through the first column it is evident that the returns to social skills are positive and statistically significant, with a single standard deviation increase in social skills being associated with an increase in income of 4 percent.

Table 2. Labor Market Returns to Social and Cognitive Skills

Dependent Variable: Log Monthly Income	(1)	(2)	(3)	(4)	(5)	(6)
Social skill	0.040***		0.037***		0.026**	0.026**
	(0.012)		(0.012)		(0.012)	(0.012)
Numeracy		0.039***	0.031**			0.029**
		(0.014)	(0.014)			(0.014)
Literacy		0.050***	0.055***			0.049***
		(0.013)	(0.013)			(0.014)
Self-esteem				0.036**	0.030*	0.026*
				(0.015)	(0.016)	(0.015)
Self-knowledge				0.040***	0.037***	0.024*
				(0.013)	(0.013)	(0.013)
Gender	0.139***	0.144***	0.147***	0.134***	0.136***	0.143***
	(0.029)	(0.028)	(0.028)	(0.029)	(0.029)	(0.028)
Work experience	0.043**	0.050***	0.045**	0.052***	0.048**	0.049***
	(0.020)	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)
Work experience^2	-0.007*	-0.006*	-0.005	-0.009***	-0.008**	-0.006*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
R-squared	0.073	0.120	0.136	0.094	0.101	0.152
Observations	590	590	590	590	590	590

Notes: Least squares regressions weighted by sampling weights. Dependent variable: log gross monthly income. Sample: Those who are employed full-time as wage earners (in contrast to individuals working without pay for family business or running own business). Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: KEEP.

This shows that on average, those with higher social skills in Korea's labor market receive higher income. The second column reports the returns to cognitive skills, without conditioning on social skills, and single standard deviation increases in numeracy and literacy are associated with an increase in income by 3.9 percent and 5 percent respectively. Column (3) reports the returns to social skills while conditioning on numeracy and literacy, which diminishes by 0.3 percentage points compared to the results shown in column (1). As the coefficients for all three skills are statistically significant, the results of the third column imply that social skills have an impact on income that is distinctive from cognitive skills. Column (4) shows the returns to other non-cognitive skills, self-esteem and self-knowledge, and it is evident that other non-cognitive skills also have a statistically significant impact on income. Column (5) includes all three types of non-cognitive skills in the model, and a standard deviation increase in social skills is associated with an increase in income of 2.6 percent. Although the estimate for returns to social skills diminishes by 1.4 percentage points compared to the result shown in column (1), the result shown in column (5) confirms that rather than a simple proxy for non-cognitive skills in general, social skills indeed have a distinctive impact on income. Column (6) reports the estimates to social skills while conditioning on all types of skills that are included in this research. All types of skills, both cognitive and non-cognitive, are shown to have a positive and statistically significant impact on income, and the returns to social skills is 2.6 percent.

Table 3 displays the coefficient estimates of returns to skills using equation (3), which controls for educational attainment. Conditioning on educational attainment, the coefficients on social skills are positive and maintain statistical significance.

Table 3. Labor Market Returns to Social and Cognitive Skills: Include Educational Attainment

Dependent Variable: Log Monthly Income	(1)	(2)	(3)	(4)
Social skill		0.038***	0.036***	0.025**
		(0.012)	(0.011)	(0.012)
Numeracy			0.028**	0.026*
			(0.014)	(0.014)
Literacy			0.053***	0.047***
			(0.013)	(0.013)
Self-esteem				0.025
				(0.015)
Self-knowledge				0.026**
				(0.012)
Education	0.115*	0.105*	0.065	0.067
	(0.062)	(0.062)	(0.062)	(0.063)
Work experience	0.045**	0.040**	0.044**	0.047**
	(0.019)	(0.020)	(0.019)	(0.019)
Work experience^2	-0.006*	-0.005	-0.004	-0.005
	(0.003)	(0.004)	(0.004)	(0.004)
Gender	0.151***	0.151***	0.154***	0.151***
	(0.029)	(0.028)	(0.027)	(0.027)
R-squared	0.069	0.086	0.141	0.157
Observations	590	590	590	590

Notes: Least squares regressions weighted by sampling weights. Dependent variable: log gross monthly income. Sample: Those who are employed full-time as wage earners (in contrast to individuals working without pay for family business or running own business) Robust standard errors in parentheses. *Education*: categorical variable representing respondent's highest education level (1=below high school graduate; 2=high school graduate; 3=college graduate and above).
*** p<0.01, ** p<0.05, * p<0.1

Source: KEEP.

Compared to returns to skills estimates without conditioning on educational attainment, the returns to skills estimates diminish by merely 1~2 percentage points. However, as mentioned in Section 3, including educational attainment in models that estimate returns to skills may have problems of endogeneity.

The regression results of equation (4), which include various job-related specifications are shown in Table 4. As explained in Section 3, equation (4) estimates the returns to social skills after conditioning for various aspects pertaining to the respondents' occupation, including firm size, occupation fixed effects and industry fixed effects. Comparing the results with the estimates that do not control for job characteristics (Table 2), controlling for the size of the respondent's firm does not induce a change in the coefficient on social skills, which remains at 2.6 percent (column (1)). As shown in columns (2) and (3), controlling for occupation and industry fixed effects reduces the coefficient on social skills by 0.4 and 0.5 percentage points, respectively. This implies that selection in to specific types of occupation or industry only partly explains the returns to social skills, and that social skills have a statistically significant impact on income within occupation and industries. Column (4) shows the regression results of equation (4) after simultaneously including the full set of the controls pertaining to occupational aspects of the respondent. A standard deviation increase in social skills is associated with an increase in income of 2.1 percent. The coefficients on other non-cognitive skills are positive and maintain their statistical significance, indicating the distinctive impact that social skills have on individual earnings.

Table 4. Labor Market Returns to Social and Cognitive Skills: Include Occupational Controls

Dependent Variable: Log Monthly Income	(1)	(2)	(3)	(4)
Social skill	0.026**	0.022*	0.021*	0.021*
	(0.012)	(0.012)	(0.012)	(0.012)
Numeracy	0.023	0.028**	0.027**	0.020
	(0.014)	(0.013)	(0.013)	(0.013)
Literacy	0.045***	0.047***	0.058***	0.053***
	(0.014)	(0.014)	(0.014)	(0.014)
Self-esteem	0.023	0.031**	0.031**	0.030**
	(0.015)	(0.015)	(0.015)	(0.015)
Self-knowledge	0.023*	0.025**	0.022*	0.022*
	(0.012)	(0.013)	(0.012)	(0.013)
Work Experience	0.046**	0.049**	0.058***	0.048**
	(0.019)	(0.020)	(0.020)	(0.021)
Work Experience^2	-0.006	-0.005	-0.006*	-0.006
	(0.004)	(0.004)	(0.004)	(0.004)
Gender	0.132***	0.108***	0.112***	0.077**
	(0.028)	(0.037)	(0.027)	(0.033)
Firm Size (log)	0.021***			0.023***
	(0.007)			(0.007)
Occupation fixed-effects		YES		YES
Industry fixed-effects			YES	YES
R-squared	0.168	0.203	0.245	0.302
Observations	586	584	583	577

Notes: Least squares regressions weighted by sampling weights. Dependent variable: log gross monthly income. Sample: Those who are employed full-time as wage earners (in contrast to individuals working without pay for family business or running own business). *Firm Size*: number of people working in respondent's workplace. *Occupation*: categorical variable that classifies respondent's main task conducted in the work place into 14 different categories based on the Korea Employment Classification of Occupations (KECO). *Industry*: categorical variable that classifies respondent's industry into 17 different categories based on the Korea Standard Industrial Classification (KSIC). Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Source: KEEP.

5. Discussion

The results of the data analyses in Section 4 present evidence of the significance of social skills in Korea's labor market. However, there are topics that need to be discussed before jumping to the conclusion that social skills deserve more attention in Korea's education. The first of these is whether or not such skills are able to be developed through education, and the second is on the question of whether the labor market relevance of a certain skill validates its necessity to be developed in schools.

As mentioned in Section 2, social skills are part of a larger category of skills often referred to as non-cognitive skills, defined as behavioral and personality attributes and skills in economics literature. Much work in this area has observed the effect of personality traits, such as the Big Five[9] personality traits or Grit[10]. The main difference between traits and skills is the possibility of enhancement through internal or external forces; while personality traits are viewed as innate and fixed, skills are viewed as malleable and modifiable (Guerra, Modecki, & Cunningham, 2014). In the case of social skills, it is natural to associate it with personality traits, such as extraversion, which would imply that there is little room for education to play a role in its development. However, skills have shown to be a mediating factor between personality and performance (Roberts, Wood, & Smith, 2007). For example, an introverted person may learn the skills to enact behaviors that are linked to extraversion (Guerra, Modecki, & Cunningham, 2014).

[9] The Big Five traits refer to the following five personality traits: Conscientiousness, Agreeableness, Neuroticism, Openness to Experience, and Extraversion.

[10] Individuals who are high on Grit demonstrate sustained effort, long-term stamina and persistence, even when faced with failure (Guerra, Modecki, & Cunningham)

The idea that social skills can be “developed” through education is supported by numerous studies. On a study of the Perry Preschool project, a randomized control trial project on education for children born in poverty with high risk of failing in school, Heckman et al. (2013) attribute social skills to be a crucial factor behind the projects impact on socioeconomic outcomes. Similarly, Dodge et al. (2014) reveal that socio-emotional skills of children are strongly associated with adulthood outcomes, such as earnings, employment, and criminal activity. Through analyses of multiple international student databases, Algan et al. (2013) show that higher frequency of group work in schools is positively related to greater student belief on the importance of cooperation with others.

The term “skills,” also referred to as competencies, has long been perceived as an entity pertaining to vocational education, in contrast to traditional schooling which is more focused on academic topics (Pring, 1995). However, this traditional approach to schooling has been criticized for its limitation in carrying social relevance (So, 2007). The OECD’s project on Defining and Selecting Key Competencies (DeSeCo) emphasizes the importance of education in taking a more demand-oriented approach so that students can obtain more practical competencies that are demanded by society and the individual (OECD, 2005). In this regard, the empirical evidence of the economic relevance of social skills, at least to some degree, provides support for the view that Korea’s education should make more efforts to incorporate the development of social skills.

6. Conclusion

Amid growing emphasis put on the importance of social skills, this study empirically tests how social skills affect wages in Korea's labor market. Results show that controlling for cognitive skills, other non-cognitive skills and other factors that affect individual earnings, social skills have a statistically significant and positive impact on income. Such results are maintained even when controlling for occupation and industry fixed effects.

While the importance of developing diverse dimensions of skills, including social skills, has been emphasized both domestically and abroad, Korea's education in general has maintained its focus on the development of cognitive skills through rote learning.

As evidenced by the results of this study, cognitive skills, although important, are in no way the only dimension of skill valued in society. Thus, more efforts should be made to develop social skills at the institutional levels of education.

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